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VIEWPOINTS

Handouts in the Classroom: Is Note Taking a Lost Skill?

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With readily available software presentation programs and projection facilities, we as faculty members have the ability to easily provide extensive handouts to our students. Furthermore, the posting of handouts on-line utilizing course management systems has become, in many cases, a standard expectation by students. Perhaps this has been motivated by our altruistic intent to provide more information than can be written on a board or to make life "easier" for our students. I would suspect many of us have probably commented or heard from students how disappointing it was that "we did not get the handout for class" or asked "if the handout would be available after the class." While technology has certainly benefited all of us by allowing the easy dissemination and collection of information to and from others in a time when the amount of new information continues to increase exponentially, faculty members should question whether providing handouts really facilitates students' learning. Perhaps, one key element necessary to facilitate learning, eg, active learning, is diminished when students are provided all the information and not directly involved in the process of identifying, collecting, and organizing the information through the process of note taking.

One could surmise, given the ubiquitous use of presentation software and handouts, that we are not providing our students with an opportunity to further develop and enhance a critical skill that is necessary for being a successful, directed life-long learner; specifically their ability to take, revise, and review their own notes. We have certainly all heard our student's lament why they did not do better on an examination since they really knew the material in the handouts. One possible explanation is that by providing all the notes, we encourage our students to become passive listeners and do not provide them with the opportunity to develop their own strategies for organizing information in their own cognitive perspective, an important element in facilitating learning.

Aspects of note taking, note revising, note reviewing, and the use of handouts as it relates to student learning has been an active area of research in the education literature over the last 30 years. DiVesta and Gray in 1972 and Peper and Mayer in 1986, discussed 2 functions of note taking critical to student learning: (1) the encoding process that occurs during note taking can alter a learner's cognitive process since it forces the student to listen, organize ideas, and relate material to his/her existing knowledge, and (2) the student is able to retrieve the information based upon his/her unique organization and structure for later review.[1-2] Furthermore, through a meta-analytical review of 33 studies, Kobayashi investigated the impact of note taking and reviewing on student learning and whether interventions to assist students in the process of note taking and reviewing can enhance learning.[3] Findings in this review indicated a substantial positive effect of note taking/reviewing. Further, Kobayashi suggests that assisting students in their note-taking/revision is warranted. Providing students with the instructor's framework notes is a significant positive intervention in the note-taking/reviewing process. In particular, students at a lower academic level benefit more in skill enhancement from note taking/revision.[3] Jerrold Barnett reported at the 2003 American Education Research Association Meeting that students who took their own notes or were provided with partial instructor notes performed better on aspects related to memory and transfer compared to students provided with a full set of lecture notes, independent of whether the students heard the lecture or not.[4]

There is also extensive literature on the use of the principle presentation software, eg, *PowerPoint*, in the classroom. Few instructors would disagree that a well-developed *PowerPoint* presentation can enhance and stimulate the learning environment by providing structure and organization, flexibility (linked material), and the ability to mix various media to accommodate different learning strategies. Another advantage is the ability to easily provide handouts both electronically and in a hard copy format.[5] Additionally, there is the perception by students that the faculty member is better prepared for class when he/she uses a *PowerPoint* presentation. Yet, we have all experienced *PowerPoint* presentations that present too much information too fast, and without guidance in integrating and facilitating key learning outcomes. Students are often not engaged in the class because the faculty member reads the slides word for word. Further these programs tend to limit our presentation styles; not all concepts are best presented using short

bullets and clip art. Students may also tend to prefer the use of *PowerPoint* since they believe it makes their learning more efficient and helps to organize and structure their note taking.[6] However, studies investigating the effects of *PowerPoint* have shown either positive effects or no effects on student learning and performance.[6]

The ability to effectively listen and organize concepts in a lecture format is a critical study skill since it is often the major pedagogical component in our programs. The disadvantage of extensive handouts, in this case, is that it tends to relieve the student of having to take meaningful notes and to later build from them a complete picture of the material. Students too often have the tendency to rely entirely on the handouts since they come from the instructor and must therefore be complete. Furthermore, their dependence on learning from handouts is often at the expense of learning from assigned readings. Finally, the availability of complete notes may reduce the incentive for students' attending class since all the information is presumably available in the handout. In 2005, Fjortoft reported that one of the main motivators for class attendance by first- and second-year professional pharmacy students was handouts were not provided.[7]

Requiring students to take notes is certainly not without its own risks. With respect to note taking, others argue that student notes may be inaccurate or incomplete unless students are provided with prominent organizational clues and immediacy by the teacher.[8] It has been suggested that students may not be effective note takers, often recording less that 50% of the important ideas in a lecture. Perhaps this is an indication of a lost skill. We can address this deficiency by providing the students with organizational clues that will improve their note-taking skills, such as using a lecture outline and pausing after key material is presented.

In our endeavors to pack as much information in a lecture as possible and to make life easier for our students, are we neglecting the importance of students developing the note-taking skills necessary for them to be self-directed life-long learners? We need to ask whether our curriculum is only about providing students with all the knowledge needed for competent patient care or rather, about providing our students with the knowledge and skills needed to be competent practitioners, specifically to enhance their skills to listen, read, organize, integrate, and utilize information in the care of their patients. If we choose the later, then perhaps it is time to rely less on providing detailed, all-inclusive handouts combined with *PowerPoint* presentations in favor of less-detailed handouts and engaging students in the process of active listening in the classroom. It is not too late for our students to return to the practice of note taking. It will, however, require each of us to place less reliance on presentation software and handouts. It will further require us to develop strategies to facilitate effective note-taking skills in our students. Finally, we may need to develop "thick skins" in our interactions with students who have come to believe they have a right to the faculty member's class notes.

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REFERENCES

1. DiVesta F, Gray S. Listening and note taking. *J Educ Psychol.* 1972;63:8-14.
2. Peper RJ, Mayer RE. Generative effects of note-taking during science lectures. *J. Educ Psychol.* 1986;78:34-8.
3. Kobayashi K. Combined effects of note-taking/-reviewing on learning and the enhancement through interventions: a meta-analytical review. *Educ Psychol.* 2006;26:459-77.
4. Barnett JE. Do instructor provided on-line notes facilitate student learning. American Educational Research Association Chicago, Ill; 2003.
5. Jones AM. The use and abuse of PowerPoint in teaching and learning in the life sciences: a personal overview. Biosci Educ eJ. 2003;2:Article 2-3. Available at: http://www.bioscience.heacademy.ac.uk/journal/vol2/beej-2-3.pdf. Accessed on April 5, 2006.
6. Susskind JE. PowerPoint's power in the classroom: enhancing students' self-efficacy and attitudes. *Comp Educ.* 2005;45:203-15.
7. Fjortoft N. Students' motivations for class attendance. *Am J Pharm. Educ.* 2005;69:107-12.
8. Titsworth BS. Student notetaking: the effects of teacher immediacy and clarity. *Comm Educ.* 2004;53:305-20.